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## Studies on the Rocky Mountain Flora—IX

By P. A. RYDBERG

### THE NYCTAGINIACEAE OF THE ROCKY MOUNTAIN REGION

The family Nyctaginiaceae has been sorely neglected by the systematic botanists in this country. Until lately we have had not even an attempt at a monographic work since Dr. Gray's notes were published in the Botany of the United States and Mexican Boundary Survey in 1859. Gray's treatment there as a whole can scarcely be regarded as an improvement on that by Choisy, published ten years earlier in De Candolle's *Prodromus*, and of course, both are now out of date. Professor Heimerl's treatment in *Die natürlichen Pflanzenfamilien* is as good as could be expected from a European monographing an almost exclusively American family; but this gives little help beyond the genera. Recently there has appeared a revision of the family by Marcus E. Jones\* as it is represented on the Great Plateau. As the territory covered by Jones practically includes that treated in this article, it would seem superfluous to duplicate the work; but I have had the advantages of a large library and the rich collections of Columbia University, the United States National herbarium, and the New York Botanical Garden. These advantages are, however, somewhat balanced by Mr. Jones' longer field experiences. Jones' paper is valuable because it gives fuller descriptions of many poorly known species, descriptions drawn by a botanist who knows the species in the field. It is deplorable, however, that this paper in many places shows a good deal of carelessness, especially in the matter of citing publications. Under *Allionia*, it has for instance:

"5. *A. GLABER* † (Wats.) Kuntze, *Am. Nat.* 76," and

"7. *A. AGGREGATA* (Vahl) Spreng. *Ic.* 5 437."

In the first case, one would suppose that Kuntze published the combination in the *American Naturalist*, while the fact is that Watson there published *Oxybaphus glaber*, on which *Allionia glabra* is based.

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\* Contributions to Western Botany, 10: 34-54. June, 1902.

† This should have been *A. glabra*.

If interpreting the second case in a similar way, one would come to the conclusion that *Oxybaphus aggregatus* Vahl was published in Vahl's Icones, if not in Sprengel's Icones ; but neither is the case, for no book with that title was ever published by either Vahl or Sprengel. From Mr. Jones' citation no one could imagine that Ic. 5 437, stands for Cavanilles' Icones, where *Mirabilis aggregata* appeared. This is not the earliest appearance of the name *aggregata*, however, for this was originally published by Ortega \* as *Calyxhymenia aggregata*. As Cavanilles' plant is different from Ortega's, the former being *Allionia decumbens* (Nutt.) Spreng., the latter *A. aggregata* (Ortega) Spreng. as shown below, Jones citation becomes not only unintelligible but also incorrect. It would have been much better to leave out the citation of publications altogether, which by the way is advisable for anyone who does not possess good library facilities.

**Key to the Genera of the Rocky Mountain Region**

Bracts distinct.

Fruit crested or winged ; bracts in a whorl at the base of the head-like cluster ; perianth salverform. 1. *Abronia*.

Fruit globular, neither crested nor winged ; bracts attached each to a pedicel of the umbel-like or corymbose inflorescence ; perianth funnelform. 2. *Hermidium*.

Bracts united.

Fruit neither strongly tubercled nor winged.

Fruit not ribbed ; involucre herbaceous, little if any enlarging in fruit, not becoming membranous.

Stamens usually 5 ; involucres campanulate, not enlarged in fruit.

3. *Quamoclidion*.

Stamens 3 ; involucre rotate, somewhat enlarged in fruit in the manner of the next genus, but not membranous.

4. *Allioniella*.

Fruit ribbed ; involucre rotate, in fruit becoming much enlarged and membranous.

5. *Allionia*.

Fruit with two rows of strong tubercles on the back and surrounded by two toothed inflexed wings.

6. *Wedelia*.

1. ABRONIA Juss. Gen. 448. 1789

*Tricratus* L'Her. ; Willd. Sp. Pl. 1 : 807. 1799.

*Cycloptera* Nutt. ; Gray, Am. Jour. Sc. II. 15 : 319. 1853.

In the original publication, no type species was mentioned. The genus was described from a plant collected on De la Peirouse's journey in California and cultivated by Mr. Colignon. Hooker in

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\* Nov. aut Rar. Pl. 8 : pl. 11. 1798 (or 9 ?).

his Exotic Flora, *pl.* 193 & 194, identifies Colignon's plant as *Abronia umbellata*. The type of *Tricratus* is the same, and that of *Cycloptera* is *A. cycloptera*.

Fruit narrowly winged or crested ; wings or crests not completely encircling the fruit.

Fruit biturbinate, *i. e.*, tapering at both ends, irregularly ridged or crested.

Flowers about 2 cm. long ; limb 5-10 mm. wide.

Bracts broadly obovate, over 1 cm. long. 1. *A. fragrans*.

Bracts ovate-lanceolate, less than 1 cm. long. 2. *A. nudata*.

Flowers about 1 cm. long ; limb 3-5 mm. wide ; bracts ovate to lanceolate-ovate, about 5 mm. long.

Petioles of the stem-leaves shorter than the very thick blades ; plant low, about 1 dm. high. 3. *A. pumila*.

Petioles of the stem-leaves much longer than the moderately thick blades ; plant slender, 2-4 dm. high. 4. *A. ammophila*.

Fruit turbinate or obpyramidal, *i. e.*, almost truncate above, distinctly winged ; the wings very broad above.

Plant almost acaulescent ; stem and leaves greatly surpassed by the long peduncles. 5. *A. nana*.

Plant with an elongated stem.

Bracts broadly ovate or obovate, acute or obtusish.

Stem distinctly viscid-pubescent ; leaves scabrous-puberulent ; bracts 1-1.5 cm. long.

Blades of the stem-leaves elliptic ; bracts broadly obovate, 12-15 mm. wide, obtusish. 6. *A. salsa*.

Blades of the stem-leaves lanceolate ; bracts oval, acute, about 6-7 mm. wide. 7. *A. fallax*.

Stem finely puberulent or glabrous ; leaves glabrous ; bracts 5-8 mm. long.

Stem puberulent. 8. *A. elliptica*.

Stem glabrous. 9. *A. glabra*.

Bracts oblong-lanceolate or lanceolate, attenuate or cuspidate.

Stem glabrous. 10. *A. lanceolata*.

Stem more or less pubescent.

Stem puberulent ; wings with double lamina, coriaceous.

11. *A. Carletoni*.

Stem villous ; wings with single lamina, membranous.

12. *A. villosa*.

Fruit completely surrounded by the broad netted-veined membranous wings.

Flowers 3 cm. or more long ; limb about 1 cm. wide ; peduncles longer than the leaves. 13. *A. cycloptera*.

Flowers 1.5-2 cm. long ; limb about 5 mm. wide.

Stem glabrous or nearly so ; peduncles often nearly equalling the leaves.

14. *A. pedunculata*.

Stem densely pubescent ; peduncles at least in flower much shorter than the leaves. 15. *A. micrantha*.

I. ABRONIA FRAGRANS Nutt.; Hook. Kew Journ. 5: 261. 1853

On the plains from South Dakota to Montana, Idaho, New Mexico and Kansas.

2. **Abronia nudata** sp. nov.

Perennial, stems very long and decumbent, sparingly hispidulous : leaves thick, glabrous ; petioles 2–10 mm. long ; blades broadly lanceolate, obtusish, 2–5 cm. long ; peduncles 4–6 cm. long, almost glabrous : bracts ovate-lanceolate, less than 1 cm. long : flowers many, about 2 cm. long ; limb 5–6 mm. wide : achenes very irregular, the inner ones of the head bipyramidal, thickest a little above the middle, crested, 8–10 mm. long, those of the margin very obliquely ovoid-fusiform, scarcely at all crested.

This species is nearest related to *A. fragrans* and *A. ammophila*. From the former it differs in the small bracts, smaller leaves and almost glabrous stem ; and from the latter in the much longer flowers and the scanty or no pubescence.

MONTANA : Colgate, near Glendive, 1892, *Sandberg, MacDougal & Heller*, 1016 (type in herb. N. Y. Bot. Garden).

3. **Abronia pumila** sp. nov.

Perennial, caespitose : stems ascending, about 1 dm. long, puberulent : leaves very thick, minutely puberulent ; petioles 1–2 cm. long, those of the stem-leaves usually shorter than blades ; these 1.5–3 cm. long, oval, elliptic or somewhat ovate : peduncles 2–3 cm. long, puberulent : bracts elliptic-ovate or lanceolate, 7–8 mm. long, short-acuminate : flowers about 12 mm. long ; limb about 3 mm. wide : fruit bipyramidal, *i. e.*, tapering towards both ends but more so downwards, the greatest breadth being about one third from the apex, merely crested or the inner ones somewhat winged.

Dr. Heimerl referred this to *A. truncata* Torr., but the fruit is very unlike that of that species. *A. pumila* is nearest related to *A. ammophila*, from which it differs mainly in the thicker and short-petioled leaves and the dwarfed habit.

UTAH : Emery, 1894, *M. E. Jones*, 54459 (type in U. S. Nat. herb.) ; six miles up Salida Cañon, 5416a.

4. **ABRONIA AMMOPHILA** Greene, *Pittonia*, 4 : 226. 1900

*Abronia arenaria* Rydb. Mem. N. Y. Bot. Garden, 1 : 137. 1900.  
Not Menz. 1827.

Yellowstone National Park.

5. **ABRONIA NANA** S. Wats. Proc. Am. Acad. 16 : 294. 1870

Southern Utah to Arizona and southern California.

6. *Abronia salsa* sp. nov.

*Abronia fragrans* S. Wats. King's Rep. 5: 284. 1871. Not Nutt.

Perennial: stem ascending, 3–4 dm. high, densely viscid-pubescent especially above, stout: leaves very thick, puberulent; petioles 2–3 cm. long; blades oval or elliptic, obtuse, or the lowest rounded oval, 3–5 cm. long, 1–3 cm. wide: peduncles 5–7 cm. long, densely viscid-pubescent; bracts rounded obovate, about 15 mm. long and often as broad, pubescent: flowers many, about 2 cm. long with a limb about 4 mm. wide: fruit about 1 cm. long, similar to those of *A. lanceolata* and *A. fallax* but the wings are rather thicker.

The sheets in the National Herbarium bear the following labeling by Dr. Heimerl: "*Abronia fragrans* Nutt. (*ad formam ellipticam* (Nelson) *accidens*!);" but neither *A. salsa* nor *A. elliptica* A. Nelson have the fruit of *A. fragrans*, and therefore can not be regarded as forms of that species. *A. salsa* differs from *A. elliptica* in the stouter viscid-pubescent stem, the larger bracts and flowers. It grows in sandy saline soil at an altitude of 1000–1300 m.

UTAH: Salt Lake City, 1869, *S. Watson*, 965 (type in herb. Columbia University); same locality, *Capt. Stansbury*, and 1871, *Hayden*; Silver Reef, 1894, *M. E. Jones*; Grand Junction, 1900, *S. G. Stokes*.

7. *Abronia fallax* Heimerl sp. nov.

Perennial; stem erect, almost shrubby below, branched, straw-color or white, viscid-pubescent above: leaves thick, puberulent, erect; petioles 1–2 cm. long; blades of the lower oval, of the upper long-lanceolate, 2–5 cm. long, 1–1.5 cm. wide, obtuse or the upper acute: peduncles 1–2 cm. long, densely viscid-pubescent; bracts 5–6, oval, about 1.5 cm. long, 6–7 mm. wide: flowers many, about 15 mm. long: fruit with the wings about 6 mm. wide and 8 mm. long, cuneate-obpyramidal.

The type in the U. S. Nat. herbarium bears the following remarks from the hand of Dr. Heimerl: "*Abronia fallax* m. — ? *Hybrida* ex *A. fragrans* et *A. turbinata*. — Ab *A. fragrans* *anthocarpinis alis apice transverse dilatatis*, ab *A. turb.* *bracteis capitulorum magnis, scariosis diversa*." \* To me it seems that the plant has little to do with *A. fragrans* and is less related to *A. turbinata*

\* In a letter lately received from Dr. Heimerl, he has authorized me to use his name and notes.

than to *A. elliptica* A. Nelson. From this it differs in the upright stem, which is decidedly viscid-pubescent instead of merely puberulent.

UTAH : Salt Lake City, 1879, *M. E. Jones*, 1337 (type in U. S. Nat. herb., also in herb. Columbia University).

8. *ABRONIA ELLIPTICA* A. Nelson, Bull. Torrey Club, 26 : 7.  
1899

Wyoming and Colorado.

9. *Abronia glabra* sp. nov.

Perennial : stem ascending, about half a meter high, glabrous, straw-colored : leaves thick, glabrous ; petioles 1–2 cm. long ; blades oval to oblong, 1–4 cm. long, obtuse : peduncles oval, 2–4 cm. long, glabrous ; bracts obovate or about 5 mm. long, acute : flowers 12–15 mm. long, numerous : fruit cuneate-obpyramidal ; with the wings 4–5 mm. wide and 7–8 mm. long : wings very thick, of two lamina, semi-cordate at the apex : wingless tip of the fruit very short.

This species is intermediate between *A. elliptica* and the next species. From the former it differs in the glabrous stem and the stricter habit, from the latter in the broader and shorter bracts and the smaller flowers.

COLORADO : Grand Junction, 1883, *M. E. Jones* (type in U. S. Nat. herb.).

10. *Abronia lanceolata* sp. nov.

Perennial : stem glabrous, decumbent, several decimeters long : leaves rather thick, glabrous ; petioles 2–3 cm. long ; blades oblong-oval, 2–5 cm. long, 1–1.5 cm. wide : peduncles 5–15 cm. long ; bracts 6–8, lanceolate, acute or acuminate, about 1 cm. long : flowers numerous, about 1.5 cm. long, with a limb 4–5 mm. wide : fruit with the thin wings about 8 mm. wide and about as long, cuneate-obpyramidal in outline, puberulent : wings strongly reticulate, semicordate at the apex, where the tip of the achene extends for about 2 mm.

The type was labeled *A. fragrans*, which species it resembles in general habit, but it is easily distinguished both by the narrow bracts and the strongly winged fruit. These characters place it nearer *A. Carletoni* Coult. & Fisher which is of a different habit and has a puberulent stem. *A. lanceolata* grows in drifting sand.

IDAHO : Idaho Falls, 1901, *Merrill & Wilcox*, 870. (Type in herb. N. Y. Botanical Garden.)

11. *ABRONIA CARLETONI* Coult. & Fisher, Bot. Gaz. **17**: 349.  
1892

Colorado.

12. *ABRONIA VILLOSA* S. Wats. Am. Nat. **7**: 302. 1873  
Southern Utah to Arizona and California.

13. *ABRONIA CYCLOPTERA* A. Gray, Am. Journ. Sci. II. **15**: 319.  
1853

From Wyoming to Texas and Arizona.

14. *Abronia pedunculata* (M. E. Jones)

*Abronia micrantha pedunculata* M. E. Jones, Proc. Cal. Acad.

- II. **5**: 716. 1895.

In the Navajo Basin of eastern Utah.

15. *ABRONIA MICRANTHA* Torr. Frem. Rep. 96. 1845  
From South Dakota to Montana and New Mexico.

2. *HERMIDIUM* S. Wats. King's Rep. **5**: 296. 1871  
A monotypic genus.

1. *HERMIDIUM ALIPES* S. Wats. *l. c.*

Nevada and western Utah.

3. *QUAMOCLIDION* Choisy ; DC. Prod. **13**<sup>2</sup>: 429. 1849

This genus was based on two species, of which the second was referred doubtfully to the genus. The first had before been known as a species of *Mirabilis*, viz., *M. triflora* Benth. The type of the genus *Mirabilis* L. is *M. Jalapa* L. In the latter the filaments are united at the base, the fruit is not viscid and the corolla is salver-shaped with a long tube and broad limb. In *Quamoclidion* the filaments are distinct, the fruit viscid and the corolla from nearly cylindrical to bell-shaped but with a small limb. In *Mirabilis* the flowers are solitary and in the typical species of *Quamoclidion* 3-6 in the involucre ; but as the number of flowers are not of value as a generic character I have here included a species with one-flowered involucre.



Involucre 5-6-flowered : perianth elongated funnelform. 1. *Q. multiflorum*.  
Involucre 1-flowered : perianth open-campanulate. 2. *Q. laeve*.

1. *QUAMOCLIDION MULTIFLORUM* Torr.; Gray, Am. Journ. Sc. II.

15: 321. 1853

*Oxybaphus multiflorum* Torr. Ann. Lyc. N. Y. 2: 237. 1828.

*Nyctaginia Torreyana* Choisy; DC. Prod. 13<sup>2</sup>: 430. 1849.

*Mirabilis multiflora* A. Gray; Torr. Bot. Mex. Bound. 173. 1859.

Choisy, who had not seen any specimens of this species and who believed that it had distinct bracts, referred it to *Nyctaginia*; but it is evidently congeneric with and closely related to *Mirabilis triflora* Benth., the type of *Quamoclidion*. *Q. multiflorum* ranges from Colorado and New Mexico to Arizona and California.

2. *Quamoclidion laeve* (Benth.)

*Oxybaphus laevis* Benth. Bot. Sulph. 44. 1844.

*O. glabrifolius* var. *crassifolius* Choisy; DC. Prod. 13<sup>2</sup>: 431. 1849.

*O. glabrifolius* Torrey, Pac. R. R. Rep. 4: 131. 1857. Not Vahl.

*Mirabilis Californica* A. Gray; Torr. Mex. Bound. Surv. 173. 1859.

*O. Californicus* Benth. & Hook. Gen. 3: 4. 1880.

This species has quite often been included in *Oxybaphus*, *i. e.*, *Allionia*, and often in *Mirabilis*. Professor Heimerl, in his treatment of the Nyctaginiaceae in *Die natürlichen Pflanzenfamilien*, merges *Oxybaphus* into *Mirabilis*; but associates this species with the one-flowered species of *Allionia*.

It is evident that if *Allionia* is to be treated as a distinct genus, *Q. laeve* can not be included in the latter genus for it lacks the essential characters, viz., the ribbed fruit and the enlarging and membranous involucre. It is evidently closer related to *Quamoclidion* than any other genus. The only important difference between it and the typical species is the open short perianth and the flowers solitary within each involucre. The species ranges from Utah to Arizona and California.

4. *Allioniella* gen. nov.

Bracts five, united into a gamophyllous viscid rotate involucre,

which enlarges somewhat in fruit but does not become membranous : flowers in each involucre 3 : perianth open, short funnel-form : stamens 3, distinct : fruit ellipsoid, neither angled nor ribbed, very indistinctly tubercled, glabrous.

Only one species.

1. **Allioniella oxybaphoides** (A. Gray)

*Quamoclidion oxybaphoides* A. Gray, Am. Journ. Sc. II. 15 : 320. 1853.

*Mirabilis oxybaphoides* A. Gray, Bot. Mex. Bound. Surv. 173. 1859.

*Oxybaphus Wrightii* Hemsl. Biol. Cent. Am. 3 : 3. 1882.

*Allionia oxybaphoides* Kuntze, Rev. Gen. 533. 1891.

From the many synonyms can be seen that this species has been moved from one genus to another. Most botanists have regarded it as an *Allionia* (*Oxybaphus*), which it resembles most in general habit, the perianth and the number of stamens ; but it lacks the most essential characters of that genus, viz., the ribbed fruit and the membranous involucre. It is, therefore, more closely related to the *Mirabilis* series ; and could be included in genus *Quamoclidion* had it not the open *Allionia*-like perianth, only three stamens and a flat rotate involucre. It is, therefore, better to regard it as the type of a new genus, intermediate between *Allionia* and *Quamoclidion*.

*A. oxybaphoides* grows from southern Colorado to western Texas and Arizona ; also in northern Mexico.

5. **ALLIONIA** Loeffl. It. Hisp. 181. 1758

*Vitmania* Turra ; Cav. Ic. 3 : 53. 1794. Not *Vitmannia* Vahl. 1794.

*Oxybaphus* L'Her. ; Willd. Sp. Pl. 1 : 185. 1797.

*Calyxhymenia* Ortega, Nov. aut Rar. Pl. Hort. Matr. 5. 1797.

*Calymenia* Pers. Syn. 1 : 36. 1805.

The genus was based on a plant which a year later received the specific name *A. violacea* L. *Vitmania* and *Oxybaphus* were both based on *Mirabilis viscosa* Cav. ; *Calyxhymenia* on *C. glabri-folia* and *Calymenia* on six species without the type being designated.

**Key to the Species**

- Leaves from cordate to broadly ovate-lanceolate : all distinctly petioled.
- Leaves cordate. 1. *A. nyctaginea*.
- Leaves ovate, rounded or cuneate at the base. 2. *A. floribunda*.
- Leaves ovate-lanceolate, oblong or linear, sessile or only the lower short-petioled.
- Involucres in open terminal cymes.
- Stem more or less hirsute as well as viscid.
- Leaves ovate or broadly oblong, as well as the stem conspicuously hirsute. 3. *A. hirsuta*.
- Leaves linear-lanceolate, almost glabrous ; stem sparingly hirsute or glabrous except under the nodes. 4. *A. pilosa*.
- Stem glabrous below, not hirsute, viscid-puberulent above.
- Flowers solitary in the involucre on short slender pedicels ; fruit nearly glabrous. 5. *A. glabra*.
- Flowers 2-3 in the involucres, subsessile ; fruit decidedly pubescent.
- Leaves of the cymes much reduced and bract-like, upper portion of the stem densely and finely puberulent. 6. *A. bracteata*.
- Leaves of the cymes neither much reduced nor bract-like.
- Leaves erect or ascending ; lobes of the involucre rounded or broadly triangular-ovate.
- Plant prostrate or diffuse ; involucres and branches of the inflorescence densely viscid hairy. 7. *A. diffusa*.
- Plants more simple, erect or ascending ; branches of the inflorescence usually merely viscid-puberulent.
- Leaves from ovate or obovate to linear-lanceolate, usually over 5 mm. wide. 8. *A. lanceolata*.
- Leaves narrowly linear, less than 5 mm. wide. 9. *A. linearis*.
- Leaves divergent ; lobes of the involucre elliptic or oval. 10. *A. divaricata*.
- Involucres on solitary axillary peduncles, rarely also in small dense terminal clusters.
- Leaves oblong, lanceolate or linear-lanceolate.
- Stem hirsute. 11. *A. aggregata*.
- Stem glabrous. 12. *A. decumbens*.
- Leaves narrowly linear. 13. *A. Bodinii*.

1. *ALLIONIA NYCTAGINEA* Michx. Fl. Bor. Am. 1 : 100. 1803

*Oxybaphus nyctagineus* Sweet, Hort. Brit. 1 : 334. 1825.

A well-known and common plant growing in rich soil from Illinois and Saskatchewan to Wyoming, New Mexico and Louisiana.\*

2. *ALLIONIA FLORIBUNDA* (Choisy) Kuntze, Rev. Gen. 533. 1891

*A. ovata* Pursh, Fl. Am. Sept. 1 : 97. 1814. Not *Oxybaphus ovatus* Vahl. 1806.

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\* *Allionia Cervantesii* has been reported from Colorado, but the specimens on which this assertion has been made belong in all cases I know to *Allioniella oxybaphoides*.

*O. floribundus* Chois ; DC. Prod. **13**<sup>2</sup>: 433. 1849.

*A. nyctaginea ovata* Morong, Mem. Torrey Club, **5**: 146. 1894.

In dry soil from Missouri and South Dakota to Wyoming, New Mexico and Texas.

3. *ALLIONIA HIRSUTA* Pursh, Fl. Am. Sept. **2**: 728. 1814

*Oxybaphus hirsutus* Sweet, Hort. Brit. **1**: 334. 1825.

In sandy soil from Minnesota and South Dakota to Colorado.

4. *Allionia pilosa* (Nutt.)

*Calymenia pilosa* Nutt. Gen. **1**: 26. 1818.

*Oxybaphus pilosus* Sweet, Hort. Brit. **1**: 334. 1825.

This has been confused with the preceding, but I think it amply distinct. So it was regarded by Nuttall and by Sweet. It is perhaps nearer related to *A. floribunda* and Nuttall cites *A. ovata* Pursh as a synonym; but it is well to note that Nuttall describes the stem of his species as pubescent, which does not agree with Pursh's plant. *A. pilosa* grows in dry sandy soil from Wisconsin and North Dakota to Texas and Louisiana.

5. *ALLIONIA GLABRA* (S. Wats.) Kuntze, Rev. Gen. 533. 1891

*Oxybaphus glaber* S. Wats. Am. Nat. **7**: 301. 1873.

A rare plant from the arid districts of southern Utah, Arizona, and New Mexico.

6. *Allionia bracteata* sp. nov.

A branched, more or less viscid perennial: stem glabrous below, densely viscid-pubescent above, 4–12 dm. high, erect or ascending: leaves sessile; blades oblong to linear-lanceolate or linear, 3–9 cm. long, thick, mostly ciliate, glabrate: leaves of the inflorescence elliptic or oblong, to lanceolate, reduced, less than 1 cm. long, more or less viscid-pubescent: involucre often numerous in terminal cymes, 10–14 mm. wide; lobes broadly ovate, obtuse: perianth white or pale, about 10 mm. broad: fruit oblong-obovate, 5–5.5 mm. long, prominently 8-ribbed, apiculate, constricted near the base.

This species has been mistaken for *A. linearis* and *A. albida*, but is easily distinguished by the reduced leaves of its inflorescence. It grows in dry rocky soil.

MISSOURI : Malden, 1894, *Bush*, 459 (type in herb. Columbia University); Wayne, 1900, 825; also Courtney, 1891; McDonald county, 1893, 310.

SOUTH DAKOTA : Spring Basin, 1891, *T. A. Williams*.

ALABAMA : Selma, 1888, *McCarthy*.

7. *ALLIONIA DIFFUSA* Heller, Minn. Bot. Stud. 2 : 33. 1898

On dry plains, from North Dakota and Wyoming, to Kansas, New Mexico and Arizona.

8. *Allionia lanceolata* sp. nov.

*A. albila* Rydb. Cont. U. S. Nat. Herb. 3 : 520. 1896. Not Walt. 1788.

A branched perennial. Stems erect or ascending, glabrous below, viscid-pubescent with short hairs, 4–15 dm. high : lower leaves short-petioled, the upper sessile ; blades lanceolate or ovate-lanceolate to almost linear, 3–10 cm. long, very thick, obtuse or blunt at the apex : involucre numerous, in terminal cymes, 1–1.5 cm. wide ; lobes rounded ovate, sometimes acutish : perianth pink, about 10 mm. broad : fruit obovoid, 4.5–5 mm. long, with usually 4–5 broad ribs and finely tuberculate faces.

This has usually gone under the name of *Allionia albida* which it resembles in habit, but that species has white perianths and sharply acute or acuminate thin leaves. *A. albida* is confined to South Carolina and Georgia and is represented by *A. lanceolata* in the West. The latter grows in dry soil on the plains, from Minnesota and Wyoming to Tennessee and Texas.

COLORADO : Estes Park, Larimer county, *Osterhout*, 1556 (type in herb. N. Y. Botanical Garden).

9. *ALLIONIA LINEARIS* Pursh, Fl. Am. Sept. 2 : 728. 1814

*Ca'ymenia angustifolia* Nutt. Gen. 1 : 26. 1818.

*Oxybaphus angustifolius* Sweet, Hort. Brit. 1 : 334. 1826.

In dry soil on the plains, from Minnesota to Montana, Arizona, Mexico and Louisiana.

10. *Allionia divaricata* sp. nov.

A slender perennial. Stems usually solitary, erect, 6–10 dm. high, glabrous and shining up to the viscid-puberulent inflorescence : leaves more or less distinctly petioled, usually spreading ;

blades glabrous, thickish, linear to linear-lanceolate, acute, 5–10 cm. long: involucre numerous, in terminal cymes about 1.5 cm. wide, cleft below the middle into elliptical or oval obtuse lobes: perianth pink, about 8 mm. wide: fruit oblong-obovoid, slightly compressed, bluntly angled and not strongly tubercled, strigose.

Perhaps closest related to *A. linearis*, but distinguished by the thinner divergent leaves, the form of the involucre and the fruit.

COLORADO: Durango, 1898, *Baker, Earle & Tracy*, 512 (type in herb. N. Y. Bot. Garden).

ARIZONA: Bakers Butte, Mogollon Mountains, 1887, *Mearns*, 253.

11. *ALLIONIA AGGREGATA* (Ortega) Spreng. Syst. 1: 384. 1825

*Calyxhymenia aggregata* Ortega, Nov. aut Rar. Pl. 8: pl. 11. 1798 (or 1799?).

*Oxybaphus aggregatus* Vahl, Enum. 2: 41, in part. 1806.

This is not the plant named *O. aggregatus* by Torrey, Watson and others, from Arizona and northern Mexico, but one that is closely related to *A. hirsuta* and generally has been confused with it. It differs mainly in the axillary solitary peduncles and in this respect is analogous to *A. Bodinii*. Vahl evidently had two plants confused, citing as synonyms *Calyxhymenia aggregata* Ortega and *Mirabilis aggregata* Cavanilles, both illustrated and closely related species of *Allionia*. Ortega's plant, which was the first published,\* is densely hirsute, while Cavanilles' plant is glabrous. Vahl, in his diagnosis, describes it as glabrous but remarks in parentheses "according to Ortega hirsute."

*A. aggregata* grows in dry soil from Wisconsin to Texas and New Mexico, also in northern Mexico.

12. *ALLIONIA DECUMBENS* (Nutt.) Spreng. Syst. 1: 384. 1825

*Mirabilis aggregata* Cav. Ic. 5: 22. pl. 437. 1799.

*Oxybaphus aggregatus* Vahl, l. c. in part.

*Calymenia decumbens* Nutt. Gen. 1: 26. 1818.

*Oxybaphus decumbens* Sweet, Hort. Brit. 1: 334. 1826.

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\* I have not been able to find the exact date of Ortega's fascicle in which the description appears. The ten fascicles were published in 1797–1800; but Cavanilles cites Ortega, which indicates that the latter's description was published first.

This species stands in the same relation to *A. lanceolata* as the preceding does to *A. hirsuta* and the following to *A. linearis*, differing mostly in the mode of blooming. One of the reasons for holding them as distinct species and not as forms of the species mentioned is that their ranges are different, *A. aggregata* and *A. decumbens* extending further south into Mexico and the Gulf states, while their cymose analogues are northern, and the range of *A. Bodinii* is more limited than that of *A. linearis*. *A. decumbens* grows in dry soil on the plains, from Missouri and South Dakota to Wyoming, Mexico and Mississippi.

13. ALLIONIA BODINII (Holz.) Morong, Mem. Torrey Club, 5 :  
354. 1894

*Oxybaphus Bodinii* Holz. Contr. U. S. Nat. Herb. 1: 287. 1893.  
In dry soil from western Kansas to Utah and western Texas.

6. WEDELIA Loeff. Iter. Hisp. 180. 1758

*Allionia* L. Syst., Ed. 10, 890, in part. 1759.

The genus was based on a plant which the following year received the specific name *Allionia incarnata* L.

1. WEDELIA INCARNATA (L.) Kuntze, Rev. Gen. Pl. 533. 1892

*Allionia incarnata* L. Syst., Ed. 10, 890. 1759.

From western Texas and southern Colorado to California.